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# FOREST CONTROL

## by CONTINUOUS INVENTORY

"Today I have grown taller from walking  
with the trees."

...Karl Wilson

Milwaukee, Wis. July, 1958 No. 52

IT IS NOT HALF SO MUCH FUN TO CORRECT MISTAKES  
AS IT MUST BE TO MAKE THEM

The repetitive measurements of identical individual trees in C.F.I. make it possible to find and correct the errors of individual cruisers. Good and bad plot work is known with every re-cruise. The wise and thoughtful cruiser will do careful work on every plot.

Now, we cannot assure ourselves of work completely without error. The forest is wide and there is no absolute control over the cruiser. All we can do is set up logical progressive steps and sound techniques for the work, train the men well, supervise and check them, and then hope for the best. The C.F.I. cruiser can do a good job in the woods -- if he wants to do a good job.

It takes two and one-half minutes to measure and describe each tree within the average plot in the north central states. Nothing changes this time very much. Extreme terrain, excessive variation in tree count, even twenty-seven card columns of tree description have very little modifying effect on this time per tree within the plot.

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CAL STOTT



There are many satisfactory sampling designs for forest inventories. The best arrangement of samples in large forest areas establishes a master grid with one plot at each station, on the corners of squares, and spaced in the woods with due allowance for slope correction. There are three sampling procedures in common use in Region Nine.

1. The Most Desirable Method with C.F.I.

Overlay the detailed map or aerial pictures of the forest with a four-square plot grid. Prick the plot locations through to the map or pictures. Study the plot location map carefully, to determine the best course to take to each plot. Record the scaled distance and protractor bearing to the plot, from the nearest transportation point. Using a pocket compass, and chaining or pacing from a roadside point, locate and establish the plot centers. There should be no conscious or unconscious bias in the establishment of these fixed plot centers.

2. The Most Commonly Used Method with C.F.I.

Determine the number of plots needed for each section over the whole forest. Locate the plots by common bearing and distance from a fixed or standard corner of each section. This method varies from the four-square plot grid only to the extent that sections deviate from normal size. This G.L.O. tie-point system is well suited to large, wild forest areas which are not roaded on forty or section lines. There must be no bias in plot center location.

3. The Least Commonly Used Method

Random sampling, though statistically desirable, is little used in forest inventory. It is falsely considered that the random arrangement of plots is a handicap in plot establishment and remeasurement. Since random plots can be tied to the ground by scale and protractor, in the same way that the four-square grid plots are located, a haphazard arrangement of plots is no detriment to the system. The random plot system does not eliminate the caution against bias.

General Rules and Instructions for Plot Location

1. All plot location is mechanical. Make no personal choice of so-called representative areas of forest in which to locate a particular plot.
2. Never shift plots away from borderline areas of forest cover. Take plots where they fall.
3. Roads, rights-of-way, and areas permanently excluded from timber production frequently occur in C.F.I. cases. These areas need not be sampled if they are deducted from the total forest area. If these areas are sampled, take the plots exactly where they fall.
4. Do not establish more than three plots per station. Multiple plot stations are sometimes necessary when there are serious limitations on time, man-power and money, and in large un-roaded and inaccessible forest areas.
5. Paint mark all starting points to plot stations. Show the plot number and the distance to it, on trees or boulders clearly visible along roads and trails.
6. At each remeasurement add new plots for newly acquired land and eliminate plots for land sold or exchanged. The number of acres of forest represented by each plot should remain about the same at the time of each measurement under the C.F.I. system.

### SETTING THE PLOT CENTERS

It has long been decided in C.F.I. that the circular plot is more efficient than the rectangular. Established in one-fifth acre size with a radius of 52.660 feet for sawlog stands, and in one-seventh acre size with a radius of 44.506 feet for pulpwood stands, the circular plot is reliable, accurate and convenient. C.F.I. does not use more than one plot size about a common center. Plot centers in all cases are metal or wooden stakes, set and witnessed today much differently than they were 10 years ago, but with the procedures simply and easily explainable.

#### General Rules and Instructions for Setting Plot Center Stakes

1. Set the plot center point by tightly crossing two tapes between four healthy witness trees, each one at least an inch in diameter.
2. Select trees for witnesses as close as possible to the center of the plot.
3. Cross the tapes between the witness trees as nearly as possible at right angles, and keep the tapes straight when setting the stake beneath the crossing point.
4. Paint mark the exact spots at which the tapes are held against the witness trees with a long arrow extending above and below the stump.
5. Use the paint freely since dampness near the ground line causes early paint deterioration. Paint band the witness trees above D.B.H.
6. When witness trees are more than a half chain from the plot center the crossed tape method is not advisable. In such cases record a pocket compass bearing and distance from the plot center to the paint marked witness tree, using the plot index tab for recording the data.
7. Small trees and brush about the center stake may be paint marked as an additional aid in locating the center point at remeasurement time.
8. Drive the plot stake close to the ground line, except in open bogs.

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MOVING THE PLOT CENTER POINTS

The plot center stake when once set may not be moved, but before establishment plot centers may be shifted to a limited extent. These limits are as follows:

1. Set the plot stake directly beneath the point where the tapes cross when stretched tightly between the witness trees.
2. To keep the full plot within the ownership being sampled, the plot center may be moved away from the ownership line a maximum distance of one chain or 66 feet. Such shifts are infrequent, occurring only with the four-square grid plot location method.
3. Plot shifts of this kind are also permitted on rights-of-way and areas permanently excluded from timber production, if such areas are deducted from the total forest area.
4. Plot shifts are not permitted in any other situations. Marginal and borderline forest cover conditions must be sampled by plots that straddle them. There is a great deal of borderline cover class within every forest.
5. The greatest volume, tree count or area present within the plot, in accordance with cover, size and density class standards in the cruising instructions, determines the cover, size and density class for plots that straddle more than one forest condition.

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See the next issue for new hints on using the plot tape and paint numbering trees.